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ABSTRACT

This field experiment on same-age peer tutoring was concerned with the differential effects on satisfaction and performance of assigned role and relative competence with junior high students. Satisfaction and performance were predicted to vary directly with prestige and with equity (status congruence) of role assignment. Same-sex, same-class, sixth- or eighth-graders (N=120) were paired such that the tutor's prior math achievement was superior, equal, or inferior to the respective tutee's. Tutors received daily training, then tutored, for two weeks. Partners exchanged roles for two subsequent weeks of tutoring. Multivariate contrast analyses on changes in end-of-week measures of achievement and satisfaction unequivocally supported the predictions. This experiment also shows that a tutoring relationship in such an impersonal topic as mathematics can have parallel effects on both performance and morale that are due in large part from considerations of status and justice. (Author)

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Who Tutors Whom, Matters: Effects of Status Inequality and Injustice
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This field experiment on same-age peer tutoring was concerned with the differential effects on satisfaction and performance of assigned role and relative competence with junior high students. Satisfaction and performance were predicted to vary directly with prestige and with equity (status congruence) of role assignment. 120 same-sex, same-class, sixth- or eighth-graders were paired such that the tutor's prior math achievement was superior, equal, or inferior to the respective tutee's. Tutors received daily training, then tutored, for two weeks. Partners exchanged roles for two subsequent weeks of tutoring. Multivariate contrast analyses on changes in end-of-week measures of achievement and satisfaction unequivocally supported the predictions.

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This field experiment was concerned with the effects on performance and satisfaction of various patterns of same-age peer tutoring at the junior high level. It represents, through the use of a larger sample and more refined measures, an extension and improvement of a previous study (Rosen, Powell, & Schubot, Note 1). It serves as a test of the predictive validity of two theoretically based models which call for more favorable outcomes for subjects in pairings which are equitable rather than inequitable, and for subjects in the role of tutor versus that of tutee.

One favorable outcome is, of course, learning or performance. Another is satisfaction or morale. The tutor has been shown, in much of the cross-age peer tutoring literature (cf. Allen, 1976; Gartner, Kohler, & Reissman, 1976; Bloom, Note 2), to achieve learning outcomes superior to the tutees', although the basis for this superiority is unclear. Could it be because tutors have more contact with the subject matter; or because of their experience in having to restructure the content they have learned for purposes of communication; or because the tutoring methods they are trained to use may (for some reason) impair tutee performance; or because of the incentive value inherent in the superior status of being the helper, i.e., the tutor?

It is rarely the case that tutors and tutees are compared directly. Where comparisons are made, the learning of tutors is usually compared either simply with some norm or with same-age controls; the same is typically done with regard to tutees. Feldman, Devin-Sheehan, and Allen (1976) point out that while previous studies using same-age controls for tutors and tutees, respectively, are to be commended, they rarely control for amount of time spent by the control students on the same subject matter. Allen and Feldman's (1973)

experiment is exceptional in this regard; they demonstrated that experimental tutors outperformed their controls, that the performance of experimental tutees did not exceed that of their controls, and that experimental tutors improved more than did their tutees. (It should be noted that their tutors did spend more time on the material than did the tutees.) Although Allen and Feldman failed to find evidence for the facilitating effects of having to restructure the material for tutoring purposes, they admit to the issue's not being resolved. In an unpublished study, we had college students learn programmed materials after leading them to believe they would be tutoring same-class peers. Other subjects, serving as controls, were given no such expectation. There were no between-group differences in learning, nor did the learning of these groups differ from that of true tutees drawn from the same population in another study (Rosen, Powell, & Schubot, 1977); however, all three groups were outperformed by the true tutors of that latter study.

With regard to the nature of tutor training, Feldman, Devin-Sheehan, and Allen's review of the literature (1976) points out that no particular method of training enjoys a particular (dis)advantage in affecting the learning outcomes of tutees. Finally, no one else, to our knowledge, has addressed empirically the motivation-relevant issue of status and equity differences in the peer tutoring context, an issue which is particularly salient in same-age, same-class peer tutoring.

Thus far we have only spoken about performance outcomes. Concerning satisfaction outcomes, the literature provides essentially no empirically based guidelines. With the possible exception of the

Salomon and Achenbach (1974) study, there is no indication whether tutors are as satisfied as tutees, much less whether such differences in satisfaction might be due to inherent status variables. Some practitioners (e.g., Rosenbaum, 1973) strongly recommend giving all students the opportunity to tutor, especially if the tutoring is within-class. The status implications of such a tutoring relationship suggest not only that the tutoring partners would react differently to their role assignments, but also that the method of pairing may well be seen as unjust and therefore dissatisfying. The issue of justice comes up when considering whether the pairing was equitable or status congruent.

As in our earlier public school experiment, it was assumed that an equitable, i.e., status-congruent, tutoring relationship produces more positive outcomes than one which is inequitable. In a tutoring dyad, assigning a student who is initially more competent than his/her partner to the role of tutor is equitable or status congruent, since the more competent one is given the role of higher status, and vice versa. Assigning an equally competent student to be tutor, is weakly inequitable, while having a less competent student tutor a more competent partner is strongly inequitable. Of course, it was also assumed that more positive outcomes derive from being assigned to the role of tutor than of tutee.

Since our public-school paradigm provided for subsequent reciprocation through role exchange, two theoretical change models, one a more compressed version of the other, were developed to deal with such changes in tutorial status and level of equity. It is these models that we sought to cross-validate. In the interest of

clarity and brevity, we only summarize the compressed version. It entails giving a desirability value of (-4.5) for being in a tutor-then-tutee sequence, and a value of $(+4.5)$ for those in a tutee-then-tutor sequence. With regard to equity, a value of (-4) was used for more competent tutors who were then made tutees, and for less competent tutees who became tutors; a value of (0) was used for equally competent tutors who became tutees, or vice versa; a weight of $(+4)$ was used for more competent tutees who became tutors. and for less competent tutors who became tutees. The theoretical values derived separately for the role-sequence and the change-in-equity dimensions were then combined additively. Their sums are shown in Table 1 of the handout.

To replicate our earlier public school experiment, an initial sample of 134 sixth- and eighth-grade mathematics students was constituted, involving 67 same-sex, same-grade, and same-class pairs. Due to their frequent absences, seven pairs of subjects did not complete the study; their data were discarded, leaving 60 pairs.

Students were stratified so that within each of four classes their prior math achievement reflected high, average, or low competence. Within each of these strata, students were paired such that one-third of the pairs were of similar previous math achievement, while two-thirds had dissimilar prior achievement records. This dissimilarity was kept small, i.e., within stratum, in the interests of not unduly upsetting participants in the unequal competence conditions. Within each tutor-tutee pair, students were randomly assigned the initial role of tutor or of tutee. Within the unequal group, half of the pairs had a higher-achieving tutor, and half a lower-achieving tutor.

As a consequence of keeping the dissimilarity in previous achievement small, the effects of the equity factor were expected to be weak compared to the effects of assigned role.

The study occupied four weeks of class time. Each Monday, the students were told what their roles would be for the current week; in fact, roles were exchanged (and the competence manipulation reinforced) only at the beginning of the third week. This schedule made it feasible to keep the possibility of reciprocation salient. Tutor training followed by tutoring took place the first four days of each week. On Fridays, the tutors were responsible for reviewing the materials with their tutees. During this daily tutor training by the research staff, the classroom teacher drilled the tutees on unrelated materials in another room. Affective responses and estimates of own performance were obtained through questionnaires administered at the beginning of weeks one and three. (We might mention, parenthetically, estimates of partner's satisfaction and performance were omitted, since they had proved unfruitful in the initial experiment.) Rather than constructing tests ad hoc, as we had in the past, objective tests were constructed from published materials in teachers' manuals. These tests, followed by a questionnaire for again assessing felt satisfaction and perceived performance, were individually administered on Fridays. The theoretical weights shown in Table 1 were applied simultaneously in a multivariate contrast analysis to all the obtained treatment means. In actuality, two multivariate contrasts were performed, one based on a more complex three-phase change model (i.e., between successive weeks), and the other based on the compressed change model (weeks 3 and 4 combined less weeks 1 and 2 combined). The greatest

change was, of course, expected between weeks 2 and 3, due to the exchange of roles. Although the model considers the effects of status level and of equity to be roughly additive, the weights given are such that status level is the more potent variable. This fact and the fact that only a weak manipulation of equity, i.e., relative competence, was attempted (for reasons of student morale) suggest that the effects of competence can be expected to show up very weakly, if at all, in conventional ANOVAs, but to show up better in the more sensitive contrast analyses alluded to above, since the more competent tutors who become tutees, and the more competent tutees who become tutors, are predicted to show the greatest change.

By and large, this proved to be the case. In the interests of brevity, suffice it to say that the three-phase contrast analysis proved significant ($F(10, 181) = 8.12, p < .001$) as did the analysis based on the compressed change model ($F(10, 105) = 10.08, p < .001$). The univariate contrasts showed that five affective measures contributed most heavily to the success of the model; namely, feeling important, useful, like the boss, proud, and desire not to switch jobs (all $p < .001$). Some additional contribution was made by perceived own performance and actual test performance.

An over-simplified but more graphic view of what these results look like can be gained by considering only how status level affects satisfaction and performance as the weeks wear on. This perspective calls for a disordinal interaction effect of role sequence and week of tutoring, such that those who begin in the role of tutor and later become the tutee (the tutor-tutee sequence) will perform better and feel more satisfied than their respective partners (those in the

tutee-tutor sequence) during the first two weeks, but that during the two weeks following the exchange of roles, the relative performance and satisfaction of the two partners will be reversed. This crossover occurred on nine of the ten measures employed, although in two cases it occurred a week late. We have graphed this crossover in the handout, in the case of desire not to switch jobs.

Finally, it might be noted that the average correlations between actual posttest performance and perceived own performance, and that between the latter and the principal measures of satisfaction, were positive and respectable ($r(118) = .33$, $p < .001$).

Our intention was not solely to demonstrate, as others have, that being a tutor facilitates one's performance in mathematics; of course, had we not obtained this effect we would have been disappointed. These results on achievement might have been stronger had we not deliberately withheld feedback for reasons of design. Of much greater moment is the fact, which this replication experiment clearly confirms, that a tutoring relationship in such an impersonal topic as mathematics can have parallel effects on both performance and morale; effects that are due in large part from considerations of status and of justice, the two essential components of the underlying theoretical model. In contrast, much of the peer-tutoring literature is focused principally on changes in performance, and on changes in individual psychological states which are conceptually rather remote from, and for that reason not especially predictive to, the context of the peer tutoring relationship. It seems that more systematic attention should be paid by both practitioners and researchers to the relational variables inherent in peer tutoring.

Reference Notes

1. Rosen, S., Powell, E. R., & Schubot, D. B. Morale and performance of same-age peer tutoring partners as a function of relative status and equity. Paper presented at the meeting of the Southeastern Psychological Association, Hollywood, Florida, May 1977.
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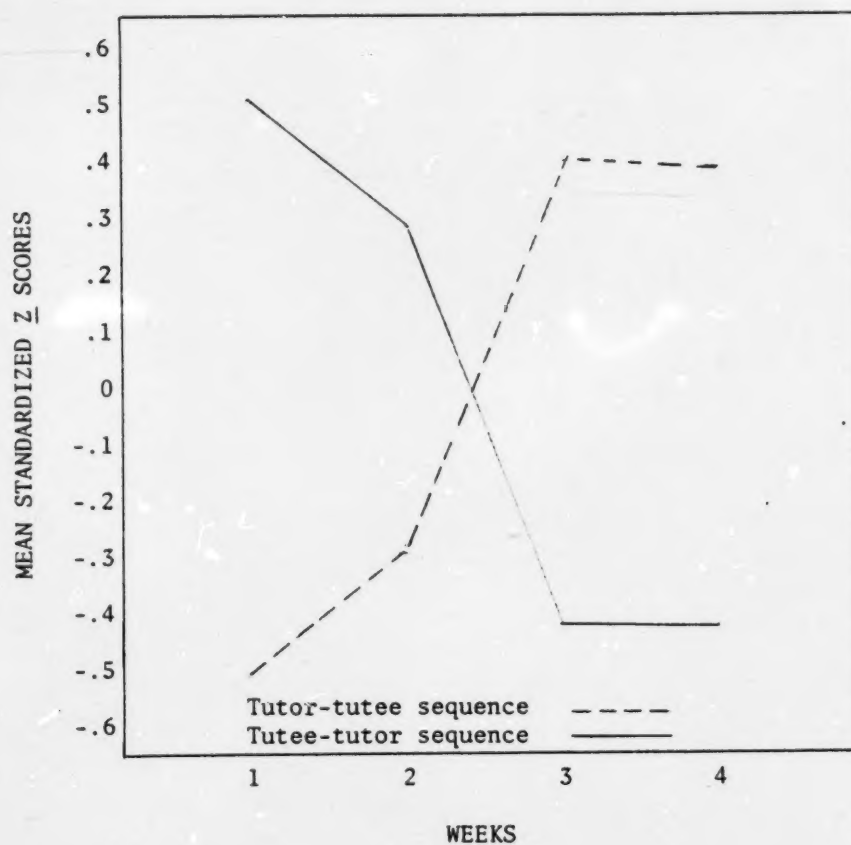


Figure 1. Desire Not To Switch Jobs as a Function of Role Sequence (standardized scores).

Table 1
Hypothetical Weights for Change Model

Role Sequence	Initial Tutor's Pretest Competence Relative to Initial Tutee's			Total
	Greater	Equal	Less	
Tutor-tutee	-8.5	-4.5	-0.5	-13.5
Tutee-tutor	+0.5	+4.5	+8.5	+13.5
Total	-8.0	0	+8.0	

Note. The "greater competence" column corresponds to an initial status congruent (or equitable) relationship and a subsequent status incongruent relationship. The "less competent" column is the complement of the "greater" column. The "equal" column reflects a weak state of status incongruence, which does not change with role exchange.

Table 2

Univariate F's from Multivariate Change Score Contrast Analysis

<u>Dependent Variable</u>	<u>F(1, 114)</u>
1. (Perceived) own test performance	3.18*
2. Own enjoyment	<1
3. Important	31.74**
4. Useful	26.03**
5. The boss	69.17**
6. Proud	31.54**
7. Own desire (not) to switch jobs	39.16**
8. Indebtedness	<1
9. Role efficacy attributed to partner	<1
10. Actual test performance	2.46

* $p < .10$.** $p < .001$.

Table 3

Means of Standardized Change Scores as a Function of Role

Sequence and Initial Tutor's Relative Competence

(Weeks 3 and 4 Combined Minus Weeks 1 and 2 Combined)

Dependent Variable	Role Sequence	Initial Tutor's Competence Relative to Tutee's		
		Greater	Equal	Lesser
1. (Perceived) own test performance	RE ^a	-.46 ^b	-.42	-.23
	ER	.46	.55	.11
2. Own enjoyment	RE	-.16	.36	-1.08
	ER	.48	.44	.18
3. Important	RE	-1.29	1.45	-.92
	ER	1.19	.69	1.64
4. Useful	RE	-1.20	-.51	-.88
	ER	.80	.42	.13
5. The boss	RE	-2.03	-1.75	-2.36
	ER	1.95	1.65	2.47
6. Proud	RE	-1.55	-.23	-1.27
	ER	.84	.44	1.73
7. Own desire (not) to switch jobs	RE	-2.05	-1.26	-1.56
	ER	1.01	1.47	2.38
8. Indebtedness	RE	.08	-.12	-.34
	ER	.02	.35	.15
9. Inferred partner's efficacy	RE	-.08	.11	-.44
	ER	.40	-.08	.17
10. Actual test performance	RE	.16	-.66	-.59
	ER	.20	.76	.22

^aRE = tutor-tutee sequence; those in this sequence were tutors for weeks 1, 2, and tutees for weeks 3, 4. This was reversed for those in the tutee-tutor (ER) sequence.

^b+, - signs represent mean increases and decreases, respectively, in the dependent variables from the first two to the last two weeks.